

TRAINING 2004

Intelligent | Adaptive | Collaborative

EVENT PROGRAM updated 11/04/04

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CONTACTS

Event Co-Chairs	
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EVENT SCHEDULE

Wednesday, October 27

Session 1: Setting the Stage

0830	Check in and gather	
0900	Clancey (NASA Ames)	<i>Applications for Mission Operations Using Multi-Agent Model-based Instructional Systems with Virtual Environments</i>
0930	Heffernan (Worcester Polytechnic)	<i>Intelligent Tutoring Systems: How and Why They Work</i>
1000	Jonassen (U of Missouri)	<i>Learning to Solve Complex (Real-World) Problems</i>
1030	Networking break	
1100	Goodkovsky (LNK Corporation)	<i>Unified Generator of Intelligent Training</i>
1130	Badler (U of Pennsylvania)	<i>From Instructions to Simulations</i>
1200	Lunch	

Session 2: Exploring Design

1300	Foshay (PLATO Learning)	<i>Learning, Teaching & Designing Problem Solving Instruction: An Assessment</i>
1330	Recesso (U of Georgia)	<i>Evidence Based Inquiry: A Methodology for Systematic Improvement in Practices</i>
1400	Networking break	
1430	Tatsuoka (GW University)	<i>Statistical Models for Cognition, with Applications to Intelligent Training and Adaptive Testing</i>
1500	Baylor (Florida State)	<i>What We Know (and Don't) Regarding the Effectiveness of Pedagogical Agents</i>
1530	Networking break	
1600	Van Eck (U of North Dakota)	<i>Learning to PI-AI: The Potential of Blended Game, ITS, and Pedagogical Agent Systems for Creating Dynamic Learning Environments</i>
1630	Bell (CHI Systems, Inc.)	<i>Deployable On-Demand Team Training with Conversational Cognitive Agents</i>

Thursday, October 28

Parallel Session 3A: Showing Solutions

0830	Check in and gather	
0900	Melton (NASA Johnson/Wyle)	<i>Just-in-Time Training Paradigms for Complex Tasks</i>
0930	Picciano (U of Utah)	<i>Just-in-Time Support (JITS): A Framework to Enhance Human Performance</i>
1000	Kring (US Army Research Inst.)	<i>Distributed Team Training and Performance in Virtual Environments</i>
1030	Networking break and technology demonstration (Picciano)	
1100	Constable (USAF School of Aerospace Medicine)	<i>USAF Visual Threat Recognition and Avoidance Trainer (VTRAT)</i>
1130	Johnson (Federal Aviation Administration)	<i>Using Web-based Blended-Training to Control Costs in Airline Maintenance Training</i>
1200	Lunch	

Parallel Session 4A: Showing Solutions

1300	Heimerdinger (Valador)	<i>Demonstration of a VR Environment for Distributed Training and Analysis</i>
1330	Sieck (Klein Associates)	<i>Making Stories Matter in Training: Tools and Technologies for Training Scenario Creation</i>
1400	Networking break and demonstration (Kumar)	
1430	West (Joint Staff - JKDDC)	<i>Toward a Joint Knowledge Development and Distribution Capability</i>
1500	Amidon (Knowledge Management Solutions)	<i>Avatars in Training and Education: Another Tool in Your Belt</i>
1530	Networking break	
1600	Hafich (CHI Systems)	<i>Developing a Common Intelligent Instructor Operator Station for Distributed Navy Aviation Simulation</i>
1630	Kumar (Ramapo College of New Jersey)	<i>Model-Based Generation of Adaptive Feedback in Intelligent Tutors - A Case Study from the Programming Domain</i>

Thursday, October 28

Parallel Session 3B: Learning from Other Domains

0900	Eliot (Amherst & Hampshire Colleges)	<i>Robust and Flexible Educational Software is the Right CHOICE</i>
0930	Lawhead (U of Mississippi)	<i>The Institute for Advanced Education in GeoSpatial Sciences: An Online Curriculum in Remote Sensing</i>
1000	Johnston (Virginia Tech)	<i>Exploring Construction Assembly Protocols in the Virtual and Industrialized Environments</i>
1030	Networking break	
1100	Woolf (U of Massachusetts)	<i>Customized Training for Critical Thinking and Mathematics</i>
1130	Shadrick (Army Research Institute)	<i>How to Train Deployed Soldiers: New Advances in Interactive Multimedia Instruction</i>
1200	Lunch	
Parallel Session 4B: Showing Solutions		
1300	Maida (NASA Johnson)	<i>Utilizing Augmented Reality To Improve Human Task Performance</i>
1330	Cochrane (NASA Ames/Raytheon)	<i>3-D Virtual Training Environments</i>
1400	Networking break	
1430	Carter (Harvard Medical School)	<i>A Psychosocial Training System for Long-duration Spaceflights</i>
1500	Mohammed (Stottler Henke Associates)	<i>Tools for Authoring Task Knowledge and Tutoring Strategies</i>
1530	Parallel session closed	

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ABSTRACTS

Abstracts are listed in alphabetical order by the speaker's last name; abstracts for both confirmed and alternate speakers are included. Where available, Web addresses for the speaker's organization or project are provided. Complete contact information is provided in the *Contact List*, but is available only to those who attend Training 2004.



The final schedule is posted online: <http://advtech.jsc.nasa.gov/t4t04.asp>

AMIDON

Thursday 10/28 at 1500, Showing Solutions 4A

Mr. Leslie Amidon, Knowledge Management Solutions

TITLE: Avatars in Training and Education: Another Tool in Your Belt

ABSTRACT: Enter the avatar. Avatars are photo-realistic, 3-D, fully animated, morphing and emotive characters, which can be used in CD-ROM, DVD-ROM, or Internet-based interactive multimedia instruction. These characters are played and controlled through a free ActiveX viewer that can be inserted into courses developed in HTML, DHTML or in native applications such as ToolBook, Authorware, etc. This presentation will provide a comprehensive overview and realistic examples of how avatars can be used in education and training products to reduce the cost of using traditional video while expanding on the promise of interactive video.

KEYWORDS: human-computer interface; intelligent systems; technology integration; training

WEB SITE: <http://www.kms-inc.net/team.asp#les>

BADLER

Wednesday 10/27 at 1130, Setting the Stage

Dr. Norman Badler, University of Pennsylvania

TITLE: From Instructions to Simulations

ABSTRACT: Human-readable instructions are essential for successful crew and mission operations, yet there are few tools for validating instructions. Using digital human models and procedural simulations, some aspects of instructions may be simulated to check potential human performance issues. A task simulation may also facilitate interactive 3D individual or team training aids.

KEYWORDS: human factors; human performance; medical operations; technology-in development (TRL 4-7); training

WEB SITE: <http://www.cis.upenn.edu/~badler/>

BAYLOR

Wednesday 10/27 at 1500, Exploring Design

Dr. Amy Baylor, Florida State University

TITLE: What We Know (and Don't) Regarding the Effectiveness of Pedagogical Agents

ABSTRACT: This presentation will provide a summary of empirical results and design principles from research by the NSF-supported Pedagogical Agent Learning Systems (PALS) Research group (for which Dr. Baylor is the Director) in the areas of pedagogical agent image, animation, and role. Interestingly, pedagogical agent features such as the image of the character can have a profound impact on both learner motivation and learning. This presentation will summarize design principles and the current state of research in this area.

KEYWORDS: HCI; intelligent systems; psychology; technology integration; training

WEB SITE: <http://pals.fsu.edu/> and <http://garnet.acns.fsu.edu/~abaylor/>

BELL

Wednesday 10/27 at 1630, Exploring Design

Dr. Benjamin Bell, CHI Systems, Inc.

TITLE: Deployable On-Demand Team Training with Conversational Cognitive Agents

ABSTRACT: Team training is increasingly time-consuming and costly as team compositions become

more heterogeneous and distributed. Cognitive agents that react like live humans can extend the reach of simulation-based training and offer a path toward cost-effective, large-scale distributed exercises. We present on-going work sponsored by DARPA's Training Superiority (DARWARS) program and related work funded through the Service laboratories that demonstrates cognitive agents in richly-verbal simulation-based training, we will demonstrate an example application illustrating spoken dialogue among the human and virtual entities in an aircrew training domain.

KEYWORDS: human performance; technology-in development (TRL 4-7); training

WEB SITE: <http://strata.chisystems.com>

CARTER

Thursday 10/28 at 1430, Showing Solutions 4B

Dr. James Carter, Harvard Medical School

TITLE: A Psychosocial Training System for Long-duration Spaceflights

ABSTRACT: This project involves the development and evaluation of an interactive media-based system to train space crews how to prevent, detect, and manage psychosocial problems that could occur on long-duration missions. Simulation-based training is conducted with "virtual crewmembers," enabling users to practice managing problems before they arise. The system is designed for pre-flight training and on-orbit support.

KEYWORDS: biomedical countermeasure; human performance; psychology; training

WEB SITE: <http://www.nsbri.org/Research/Projects/viewsummary.epl?pid=111>

CLANCEY

Wednesday 10/27 at 0900, Setting the Stage

Dr. William J. Clancey, NASA Ames

TITLE: Applications for Mission Operations Using Multi-Agent Model-based Instructional Systems with Virtual Environments

ABSTRACT: This presentation relates the various themes of the Intelligent Tutoring System to new plans for the human-robotic exploration of space. Opportunities include: adapting student modeling to the problem of instructing robotic systems in cooperative assembly and maintenance tasks, providing astronauts with refresher training and tutorials for new engineering procedures, web-based systems for representing and sharing scientific discoveries, multi-agent systems using natural language for life support and surface exploration, and virtual reality for design and training of human-robotic systems.

KEYWORDS: human-centered computing; intelligent systems; technology-in development (TRL 4-7); training

WEB SITE: <http://bill.clancey.name>

COCHRANE

Thursday 10/28 at 1330, Showing Solutions 4B

Mr. Tom Cochrane, Raytheon

TITLE: 3-D Virtual Training Environments

ABSTRACT: Crew training represents a substantial portion of the budget for space exploration. During long-duration exploration, crewmembers will lose some of the knowledge and skills acquired during training on Earth. As space operations become increasingly autonomous, we will need improved methods of onboard training approaches to reduce cost and risk while maintaining key performance capabilities. Addressing training issues early in a program helps avoid costs escalating later. We are developing a crew training 3-D environment running on a laptop to provide crew with reinforcement of systems knowledge and skills. We can briefly demonstrate this system during the talk.

KEYWORDS: intelligent systems; technology integration; technology-in development (TRL 4-7); training

WEB SITE: <http://www.digitalspace.com/>

CONSTABLE

Thursday 10/28 at 1100, Showing Solutions 3A

Dr. Stefan Constable, USAF School of Aerospace Medicine

TITLE: USAF Visual Threat Recognition and Avoidance Trainer (VTRAT)

ABSTRACT: Air Force aircraft scanners (crewmembers) have the primary duty to identify anti-aircraft

threats, direct the pilot and crew in performance of evasive maneuvers, and deploy countermeasures during an anti-aircraft threat engagement. The Visual Threat Recognition and Avoidance Trainer (VTRAT) combines state-of-the-art visual, interactive simulations with intelligent tutoring methodologies to train visual scanners in the various weapons systems. Cognitive psychology suggests that the best way to automate a response is repetition, while incrementally increasing the workload and decreasing the response time. This methodology is embodied in a progression of exercises that break up the overall primary scanning duty into small "chunks" of learning material, interspersed with drills that reinforce learning and dynamically adjust to exercise weaker areas of student performance. VTRAT is an adaptive instructional training aid, designed to introduce or refresh scanners on their duties during an anti-aircraft threat engagement.

The visual simulation displays realistic visual characteristics of anti-aircraft weaponry such as missile fly-out and anti-aircraft artillery (AAA) rate-of-fire, as seen from the scanner's viewpoint in the aircraft. Instruction in VTRAT is delivered in the context of flight over a simulated threat environment. The student views this environment on a high-resolution 67" display system, from the perspective of his/her duty position. The student hears the instructional text through a headset, and interacts with the trainer via a voice recognition system, as well as the communication and flares countermeasures controls available on the real-world aircraft. VTRAT diagnoses weak areas of student performance and emphasizes training in these areas until mastery of the specific threat protocol is achieved.

Five software components collaborate to provide VTRAT functionality: these components were implemented using commercial-off-the-shelf (COTS) and government-off-the-shelf (GOTS) development tools on COTS hardware. The GUI allows the instructor to modify numerous simulation dynamics such as scanner viewpoint, aircraft altitude, airspeed, etc. Currently, VTRAT contains courses to train threat recognition and avoidance for over 30 duty positions across 7 weapon systems. Instructors may choose to deviate from automated lessons and construct custom drills, or fire and discuss specific threats.

Instructional text is delivered as synthesized speech output, and scanner communications are electronically monitored. The speech recognition software provides speaker independent continuous speech recognition, with no training requirements. The Threat System models a variety of ground-to-air threats, including AAA, surface-to-air missiles and radar threats. It dynamically generates threats using physics-based models certified as realistic for training. The tutoring technology is highly adaptable and would lend itself to ADL applications. This technology could also be integrated with flight deck simulators for crew coordination training with distributed mission training.

KEYWORDS: human factors; human performance; technology integration; training

WEB SITE: <http://www.mesa.afmc.af.mil/html/vtrat.htm>

ELIOT

Thursday 10/28 at 0900, Learning from Other Domains

Dr. Christopher Eliot, Amherst and Hampshire Colleges

TITLE: Robust and Flexible Educational Software Is the Right CHOICE

ABSTRACT: The CSOWL system successfully supported teaching introductory programming to 1500 students over three years in large classes. The successor, CHOICE, is designed to satisfy the more demanding requirements of small class usage, where flexibility is paramount, students expect individual attention and potential cost savings are minimal. The technology incorporates adaptive intelligent tutoring methods developed for cardiac resuscitation (ACLS) training with a core implementation engineered for robust, flexible performance and has been deployed for use in CS1 and CS2 courses in the Five College Region of Western Massachusetts.

KEYWORDS: emergency operations; human-centered computing; intelligent systems; technology integration; technology-in development (TRL 4-7)

WEB SITE: <http://www-unix.oit.umass.edu/~eliot/>

FOSHAY

Wednesday 10/27 at 1300, Exploring Design

Dr. Rob Foshay, PLATO Learning, Inc.

TITLE: Learning, Teaching and Designing Problem Solving Instruction: An Assessment

ABSTRACT: Three previous papers (Foshay 1995, Foshay 1997, Foshay and Kirkley 1998) examined the current cognitive research on problem solving, and asked what instructional strategies based on that

work might be used to improve the then-standard (behaviorally based) recommendations for teaching problem solving. In the past decade, there has been continued progress in the understanding of what problem-solving skills are for novices and experts. There has been some advancement in our understanding of how problem-solving is learned, and in how to teach certain kinds of problem-solving skills. The focus of inquiry has shifted somewhat, from descriptive analysis of high-level problem solving to the use of problems in instruction. But there are still many unanswered questions about instructional strategies and their corresponding design techniques. For background, we will first provide a brief sample of some current descriptive thinking on problem solving. Then, we will reframe the inquiry around problems in teaching. Finally, we will comment on current lines of investigation surrounding design of instructional problems. We will conclude with a discussion of key questions which, in our view, are critical to advance our understanding of problem solving instruction and measurement.

KEYWORDS: technology-concept (TRL 1-3); training

WEB SITE: <http://www.speakeasy.org/~rfoshay/page2.html>

GOODKOVSKY

Wednesday 10/27 at 1100, Setting the Stage

Dr. Vladimir Goodkovsky, LNK Corporation

TITLE: Unified Generator of Intelligent Training

ABSTRACT: Training for tomorrow must be cost-effective, but the most effective intelligent training systems are still exclusive, labor consuming and expensive. The Unified Generator represents a ready-made logical core (authoring tool + framework + engine) of intelligent training systems. It integrates the best of the breed simplifying authoring, facilitating reusability/share-ability and reducing the cost of the most effective intelligent training.

KEYWORDS: intelligent systems; technology integration; technology-in development (TRL 4-7); training

WEB SITE: <http://www.intelligent-tutor.com>

HAFICH

Thursday 10/28 at 1600, Showing Solutions 4A

Ms. Amanda Hafich, CHI Systems

TITLE: Developing a Common Intelligent Instructor Operator Station for Distributed Navy Aviation Simulation

ABSTRACT: US Navy aviation training faces new challenges today with the introduction of simulation-based networked training. One challenge that must be met is improving the effectiveness and efficiency of instructors in what is becoming an increasingly complex and demanding training environment. The present work is based upon a program of research that focuses on new ways to improve the usability and capabilities of the Instructor Operator Station (IOS) subsystem, which is a key component of all aviation simulation systems (Walwanis Nelson, Owens, Smith, Bergondy, 2003).

KEYWORDS: human factors; performance; human-computer interface; intelligent systems; training

WEB SITE: <http://www.ntsc.navy.mil/>

HEFFERNAN

Wednesday 10/27 at 0930, Setting the Stage

Dr. Neil Heffernan, Worcester Polytechnic Institute

TITLE: Intelligent Tutoring Systems: How and Why They Work

ABSTRACT: Intelligent Tutoring Systems have been built for a variety of training needs from tutoring teams of soldiers doing "room clearing" to teaching students mathematics. Existing systems are being used hundreds of thousands of students across the United States. I will address the topic of what Intelligent Tutoring Systems are and how they help students learn. I will then discuss why the Office of Naval Research is funding us to make "Authoring Tools" to reduce the cost of construing the cognitive models that used inside of intelligent tutoring systems. Finally, I will demonstrate an intelligent tutoring system we are building for the Army.

KEYWORDS: human-centered computing; human-computer interface; intelligent systems; psychology; training

WEB SITE: <http://www.cs.wpi.edu/~nth/>

HEIMERDINGER

Thursday 10/28 at 1300, Showing Solutions 4A

Dr. Daniel Heimerdinger, Valador

TITLE: Demonstration of a Virtual Reality Environment for Distributed Training and Analysis

ABSTRACT: Advanced commercial gaming technologies provide existing environments that can be expanded for distributed training applications. DSL access provides capabilities for real-time Internet access into systems enabling virtual access to high fidelity simulations of NASA systems for training, analysis, and decision making.

KEYWORDS: human-computer interface; technology-in development (TRL 4-7); training

JOHNSON

Thursday 10/28 at 1130, Showing Solutions 3A

Dr. William B. Johnson, Federal Aviation Administration

TITLE: Using Web-based Blended Training to Control Costs in Airline Maintenance Training

ABSTRACT: Airlines and maintenance organizations are delivering web-based blended training for human factors training for maintenance personnel. The training is designed to comply with the new regulations from the European Aviation Safety Agency and Transport Canada as well as from FAA guidance materials. This paper shows how blended-training raises quality and consistency while lowering delivery costs.

KEYWORDS: human factors; performance; technology-in mature (TRL 7-9); training

JOHNSTON

Thursday 10/28 at 1000, Learning from Other Domains

Mr. Brendan Johnston, Virginia Tech

TITLE: Exploring Construction Assembly Protocols in the Virtual and Industrialized Environments

ABSTRACT: Accurate virtual modeling of construction assembly is challenged by the largely unstructured integration of products and processes within a dynamic environment. Current university research is focused on production homebuilding as an industrialized approach to a traditionally craft based process. This talk highlights experienced gained from attempts to simulate and prototype industrialized homebuilding process at Virginia Tech.

KEYWORDS: human factors; human-computer interface; training

JONASSEN

Wednesday 10/27 at 1000, Setting the Stage

Dr. David Jonassen, University of Missouri

TITLE: Learning to Solve Complex (Real-World) Problems

ABSTRACT: Learning to solve complex, ill-structured (real-world) problems that pervade every scientific workplace, such as troubleshooting, systems analysis, design, decision making, requires fundamentally different kinds of instructional support than learning about content (the implicit goal of most training). Different kinds of problems entail different cognitive and socio-cultural processes. After describing a typology of problems, I will show how various technologies, such as case libraries, simulations, learning objects, multi-layered conceptual models and modeling tools, flexibility hypertexts, argumentation supports, and others, can be used in learning environments to support different kinds of problem solving. Additionally, I will describe requirements for adequately assessing different kinds of problems.

KEYWORDS: human performance

WEB SITE: <http://tiger.coe.missouri.edu/~jonassen/>

KRING

Thursday 10/28 at 1000, Showing Solutions 3A

Dr. Jason Kring, US Army Research Institute

TITLE: Distributed Team Training and Performance in Virtual Environments

ABSTRACT: Distributed Immersive Virtual Environments (DIVEs) are effective test beds for examining how geographically separate team members perform common tasks. Our research reveals distributed

teams face unique challenges in comparison to traditional, face-to-face teams. This presentation will describe the Army's DIVE system and summarize results of two major team-training studies.

KEYWORDS: human factors; human performance; technology-in development (TRL 4-7); training

KUMAR

Thursday 10/28 at 1630, Showing Solutions 4A; Demonstration 10/28 at 1430

Dr. Amruth Kumar, Ramapo College of New Jersey

TITLE: Automatic Generation of Adaptive Feedback in Model-Based Intelligent Tutors - A Case Study from the Programming Domain

ABSTRACT: We have developed model-based algorithms to automatically generate demand feedback in intelligent tutors, and adapt it to the needs of the learner. We have applied these algorithms for the C++/Java programming domain and evaluated the effectiveness of the resulting feedback. Advantages of our approach include-the automation of feedback generation for any problem in a domain, and therefore, better scalability of the resulting tutor.

KEYWORDS: informatics; technology-in development (TRL 4-7); training

WEB SITE: <http://orion.ramapo.edu/~amruth/>

LAWHEAD

Thursday 10/28 at 0930, Learning from Other Domains

Dr. Pamela Lawhead, The University of Mississippi

TITLE: The Institute for Advanced Education in GeoSpatial Sciences: An Online Curriculum in Remote Sensing

ABSTRACT: This presentation will discuss the NASA funded project which has created 30 courses in remote sensing and geospatial sciences. It allows students anywhere to pursue advanced education by using courses created by national experts and hosted online at the Institute.

KEYWORDS: intelligent systems; sensor; technology integration

WEB SITE: <http://geoworkforce.olemiss.edu/> and <http://john.cs.olemiss.edu/~lawhead/>

MAIDA

Thursday 10/28 at 1300, Showing Solutions 4B

Mr. James Maida, NASA Johnson

TITLE: Utilizing Augmented Reality to Improve Human Task Performance

ABSTRACT: Improvement of current trainer design using enhanced visual display information (dynamic overlays or augmented reality) are candidates for improving human performance. Because of the potentially significant costs of implementation in production trainers and flight hardware, it is important to accurately determine the degree of improvement.

KEYWORDS: human factors; human performance; human-computer interface

WEB SITE: <http://jsc-web-pub.jsc.nasa.gov/hefo/hhfo/graf/charter.htm>

MELTON

Thursday 10/28 at 0900, Showing Solutions 3A

Ms. Shannon Melton, NASA Johnson / Wyle Labs

TITLE: Just-in-Time Training Paradigms for Complex Tasks

ABSTRACT: Training for complex tasks is challenging due to time constraints, we developed just in time compressed training programs, coupled to a state-of-the-art computer-based learning tool (On-board Proficiency Enhancer, OPE) which allows minimally trained, non-physician astronaut crews to perform complex medical tasks. Feedback on operator time on task, performance, and tracking is collected and transmitted to the primary team to allow task refinement. Feedback on astronaut/ principal investigator utility of the program from the Increments 8 and 9 crews will be provided.

KEYWORDS: biomedical research; emergency operations; informatics; technology-mature (TRL 7-9); training

WEB SITE: <http://hrf.jsc.nasa.gov/science/e083.htm>

MOHAMMED

Thursday 10/28 at 1500, Showing Solutions 4B

Dr. John Mohammed, Stottler Henke Associates, Inc

TITLE: Tools for Authoring Task Knowledge and Tutoring Strategies

ABSTRACT: Authoring tools can significantly reduce the time, cost and difficulty of developing intelligent tutoring systems. Stottler Henke has developed tools that enable rapid authoring by non-programmers of the task knowledge and instructional strategies used for coaching and after-action review. These tools are being used to develop simulation-based tutors for helicopter piloting, satellite operations, tactical decision-making, and NASA payload operations.

KEYWORDS: human performance; human-computer interface; technology-in development (TRL 4-7); training

WEB SITE: http://www.shai.com/solutions/training/its_background.htm

PICCIANO

Thursday 10/28 at 0930, Showing Solutions 3A; Demonstration 10/28 at 1000

Mr. Paul Picciano, University of Utah

TITLE: Just-in-Time Support (JITS): A Framework to Enhance Human Performance

ABSTRACT: Just-in-time support is designed to facilitate non-expert performance of a structured task. The system provides a workable plan, actionable cues and supportive feedback to guide an operator through the task. The system integrates support with the task and relies heavily on visualizations, smart sensors, and expertise considerations. JITS focuses on user completion of the task-at-hand and unlike many tutoring systems is not concerned with long-term learning (doing rather than learning). Thus, a different approach is needed.

KEYWORDS: emergency operations; human performance; human-centered computing; information display; intelligent systems

WEB SITE: <http://www.psych.utah.edu/gradstuds/picciano.html>

RECESSO

Wednesday 10/27 at 1330, Exploring Design

Dr. Arthur Recesso, University of Georgia

TITLE: Evidence-Based Inquiry: A Methodology for Systematic Improvement in Practices

ABSTRACT: Evidence-based inquiry (EBI) is a methodology that enables different stakeholders to systematically examine evidence of the relationship between practices and goals. Practices are teaching enactments, that is, how raters and practitioners actually utilize various methods, artifacts and tools in situ. EBI provides direct evidence of the link between practices and target goals, and the means through which progress can be documented, analyzed and assessed.

EBI methodology enables stakeholders to identify those practices that contribute to specific successes or failures in a given teaching-learning setting. It enables the precise study of specific teaching-learning events within teaching environments that often involve multiple interactions, simultaneously reducing interference or "noise" from extraneous aspects while amplifying critical actions and consequences within the event. In effect, the methodology guides the strategic linking of data (e.g., performance on physical science concepts) to teaching practices (plans, work sample, video of instruction) where evidence can be collected and equated. An EBI toolkit is designed to shift decision making practices, reifying a focus on instructional improvement, and enabling individual and collaborative reflection and feedback. It is one instantiation demonstrating how raters and practitioners engage EBI methodology for continuous improvement and support. We utilize our EBI toolkit—video capture and analysis tools—to gather and rate direct evidence of teaching learning practices (See <http://lpsl.coe.uga.edu/ebi/> for more complete descriptions and samples of the capture and coding technology). These tools were developed and refined through funding from the US Department of Education: Preparing Tomorrow's Teachers to use Technology (PT3).

KEYWORDS: human performance; intelligent systems; technology-in development (TRL 4-7); training

WEB SITE: <http://lpsl.coe.uga.edu>

SHADRICK

Thursday 10/28 at 1130, Learning from Other Domains

Scott Shadrick, US Army Research Institute

TITLE: How to Train Deployed Soldiers: New Advances in Interactive Multimedia Instruction

ABSTRACT: A major goal of the Future Combat System of Systems (FCS) embedded-training strategy is to develop a training capability that provides accurate, timely, relevant, and affordable training in support of operational needs. Embedded training will lay the foundation for Unit of Action training. In this presentation we focus on the training needs of deployed soldiers and attempt to show that the oft-cited solution of embedded training—in particular, embedded training based on an embedded constructive tactical engagement simulation—is no panacea. We discuss some of the obstacles, barriers, and technical challenges associated with embedded training and discuss more effective alternative training methods.

KEYWORDS: human performance; psychology; training

WEB SITE: <http://www-ari.army.mil/research/training.htm>

SIECK

Thursday 10/28 at 1330, Showing Solutions 4A

Dr. Winston Sieck, Klein Associates

TITLE: Making Stories Matter in Training: Tools and Technologies for Training Scenario Creation

ABSTRACT: Klein Associates has been pursuing research that aims to bring the power of stories forward to build decision-making expertise. In this talk, the development of tools that aid instructors in the creation and facilitation of cognitively authentic scenarios will be discussed.

KEYWORDS: human performance; psychology; technology-in development (TRL 4-7); training

TATSUOKA

Wednesday 10/27 at 1430, Exploring Design

Dr. Curtis Tatsuoka, George Washington University

TITLE: Statistical Models for Cognition, with Applications to Intelligent Training and Adaptive Testing

ABSTRACT: Statistical classification models based on partially ordered sets will be described. Partially ordered sets provide a rich and detailed class of models for cognition, and hence can serve as a basis for next-generation intelligent training. A real-life application will be presented which demonstrates that through adaptive testing methods based on these models, dramatic gains in efficiency can be achieved in terms of reducing the amount of testing.

KEYWORDS: human performance; intelligent systems; training

WEB SITE: <http://www.gwu.edu/%7Estat/tatsuoka.htm>

VAN ECK

Wednesday 10/27 at 1600, Exploring Design

Dr. Richard Van Eck, University of North Dakota

TITLE: Learning to PI-AI: The Potential of Blended Game, ITS, and Pedagogical Agent Systems for Creating Dynamic Learning Environments.

ABSTRACT: The potential of games and play for increased learning, especially problem-solving and transfer of learning, is well-documented (e.g., Lepper and Chabay, 1985, Reiber, 1996, Malone, 1985, Brown, Collins, and Duguid). Likewise, the use of pedagogical agent environments and intelligent tutoring systems like AutoTutor has increased. The power of these learning technologies has not been tapped, despite the growth and availability of authoring tools for these environments. This presentation will discuss the theoretical underpinnings of and current research on these technologies, as well as present some practical approaches for blending them according to current research on instructional games and pedagogical theory.

KEYWORDS: human performance; intelligent systems; technology-concept (TRL 1-3); training

WEB SITE: <http://www.und.nodak.edu/instruct/rvaneck/>

WEST*Thursday 10/28 at 1430, Showing Solutions 4A***Dr. Jerry West, Joint Staff JKDDC JMO****TITLE:** Toward a Joint Knowledge Development and Distribution Capability

ABSTRACT: Transforming the training of the individual warfighter to meet the new challenges of the modern day threat requires the evolutionary acquisition of advanced distributed learning and knowledge management technologies. Distance learning has focused primarily on creating a system for delivering data to computers. Little, however, is being done to bridge the last meter to the joint warfighter: to go from the bytes within a computer to knowledge and understanding inside the head of our transformed warriors. We will need a new kind of training paradigm and new kinds of training devices if we are to jump that last meter. We will not meet the promise of a transformed military if we don't match the revolution in military affairs with a revolution in training. This presentation addresses technologies that are required to transform the Joint warrior under the DoD Joint Knowledge Development and Distribution Capability (JKDDC) Initiative.

KEYWORDS: technology integration**WEB SITE:** <http://www.t2net.org/index.htm>**WOOLF***Thursday 10/28 at 1100, Learning from Other Domains***Dr. Beverly Park Woolf, University of Massachusetts****TITLE:** Customized Training for Critical Thinking and Mathematics

ABSTRACT: We describe three intelligent tutors that customize training for individual students, enable students to collaborate over the web and, in some cases, run on handheld devices. These tutors use machine learning to improve their own performance, thus reducing the cost and time of tutor development. The tutors adapt to student needs, skills and individual styles, can infer student engagement and have been tested in colleges (geology, biology, forestry and engineering), high schools (geometry) and middle schools (arithmetic).

KEYWORDS: human performance; human-centered computing; human-computer interface; intelligent systems; training

WEB SITE: Inquiry tutor, <http://ccbit.cs.umass.edu/rashihome/>Geometry tutor, <http://ccbit.cs.umass.edu/wayang/>Arithmetic tutor, <http://ccbit.cs.umass.edu/ckcold/researchpages/animalwatch.html>

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